REMARKS

Summary of Amendments

1. Claims 1-8 were originally presented in this application. Claim 1 was amended in a reply dated November 30, 2005. Claims 9 and 10 were added in a reply dated August 17, 2006. Claims 1 and 9 have been amended, as described in more detail below, to more particularly point out and distinctly claim the subject invention. No claims have been added or canceled in this paper. Claims 1-10 remain pending.

Claim Rejections – 35 U.S.C. § 112

2. Claims 1-8 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner states, "In claim 1, it is unclear how the shaft is disposed create the recited cavity in the wafer-carrying face, since the ceramic substrate already has a molded surface having the recited initial concavity."

3. Applicants respectfully traverse this rejection to the extent that it is pertinent to independent claim 1, as amended. Claim 1, now recites:

> a ceramic substrate joined to a substantially pipe-shaped shaft... the pipe-shaped shaft disposed to warp the substrate in a controlled manner such that said concavity of the wafer-carrying face decreases upon heating of the substrate."

Applicants respectfully submit that claim 1 now distinctly claims the subject matter which Applicants regards as the invention. Accordingly, it is respectfully submitted that the § 112 rejection of independent claim 1 has been overcome.

Claim Rejections – 35 U.S.C. § 103

4. Claims 1-10 stand rejected under 35 USC § 103(a) as being unpatentable over Satoh et al. (U.S. Pat. No. 6,761,771) in view of Storbeck (U.S. Pat. App. Pub. No. 2002/0023590). In particular, the Examiner states,

> With respect to the recited shaft being disposed to warp the substrate in the controlled manner, Satoh having the shaft would also inherently perform the recited controlled manner as that of the recited claim having the same structure as that of the claimed recitation. Likewise, the recited curvature when the substrate is heated to 500° C with the

claimed isothermal rating in claim 10 would also have been inherent functions or characteristics as the prior art having the substantially identical structure as that of the claimed invention (see MPEP 2112.01).

5. Applicants respectfully traverse this rejection to the extent that it is pertinent to independent claims 1 and 9, as amended. Independent claims 1 and 9 have both been amended to recite: "a ceramic substrate joined to a substantially pipe-shaped shaft." These amendments are supported by the original specification, such that no new matter has been added. For example, page 13, lines 4-6 explicitly teach "pipe-shaped support members . . . joined" to the ceramic susceptors. Claim 1 has been further amended to recite: "the pipe-shaped shaft is disposed to warp the substrate in a controlled manner such that said concavity of the wafer-carrying face decreases upon heating of the substrate." This amendment is also supported by the original specification—in Table I, for example—such that no new matter has been added.

6. Applicants respectfully submit that independent claims 1 and 9 now distinguish patentably over the prior art of record. The shaft recited in claims 1 and 9 distinguishes over that disclosed by *Satoh et al.* for at least two important reasons. First, claim 1 recites a "pipe-shaped" shaft. On the contrary, *Satoh et al.* makes no written disclosure of the shape of the shaft. Figure 1 *Satoh et al.* appears to indicate a solid cylindrical shaft. Second, claim 1 recites that the shaft is physically "joined" to the substrate. There is no such teaching in *Satoh et al.* Accordingly, the combination of *Satoh et al.* and *Storbeck* cited by the Examiner cannot teach each of the elements of claim 1 (as required by MPEP 2143).

7. Applicants further submit that the Examiner's comments regarding the shaft being disposed to warp the substrate in a controlled manner are without basis. The following two mechanisms describe the process by which the shaft causes the concavity of the wafer-carrying face to decrease with heating of the substrate. First, heating the substrate results in a temperature difference between the wafer-carrying face and the opposite face of the substrate, due to the thermal conductivity of the shaft (which transports thermal energy away from the substrate). As a result, the wafer-carrying face undergoes a greater amount of thermal expansion than the opposite face, which tends to reduce the concavity of the wafer-carrying face (i.e., warps the substrate such that the wafer-carrying face becomes more convex). This mechanism becomes particularly pronounced by the shaft being joined to the substrate (which promotes thermal conductivity between the substrate and the shaft). Second, heating the substrate causes a temperature gradient along the length of the shaft. This temperature gradient results in a warping of the upper face (the support face) of the shaft, which, being joined to the substrate, further promotes substrate warping in the direction previously stated. This second mechanism has been observed to be more

pronounced in a pipe-shaped (tubular shaft), and also is conditional on the shaft being physically joined to the substrate (on account of which stress from the shaft is transferred to the substrate). Thus, since *Satoh et al.* teaches neither a pipe-shaped shaft nor physically joining the shaft to the substrate, the controlled manner in which the shaft warps the substrate cannot be inherent in the prior art of record. Regarding claim 9, the recited curvature when the substrate is heated to 500° C also cannot be inherent in the prior art of record. Accordingly, for the foregoing reasons, Applicants courteously urge that the § 103(a) rejections of independent claims 1 and 9 have been overcome.

8. Applicants respectfully submit that independent claims 1 and 9 are allowable over the prior art of record. Claims 1 and 9 being allowable, it follows that dependent claims 2-8 and 10 must also be allowable, since these claims carry with them all of the elements of the independent claims to which they ultimately refer.

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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